

By 1858 the controversy over slavery had become acute and Abraham Lincoln voiced the sentiments of many when he said, "I believe this Government can not endure permanently half slave and half free. I do not expect that the house will fall, but I expect that it will cease to be divided. It will become all one thing or all the other."

GENERAL CLIMATIC INFLUENCES IN NATIONAL DEVELOPMENT.

What the United States is to-day, she is to a considerable degree because of climatic control. Not only is this true because of the influence of meteorological factors on special events of importance in the history of the nation, but also because of the effect of the climate on the country as a whole. Two of these climatic influences on the development of the country may be mentioned in concluding this paper. "The strength of England," says Professor Shaler (11, p. 119), "and of the English race in North America, the dominance in the world of that peculiar kind of man, depends upon coal." Since that is the case, the strength of the American people and the power of the United States in the world are due in a large way to those climatic conditions which prevailed in North America during Carboniferous times.

But this strength and dominance are due as much to the climate which prevails over the same region to-day. The greatest nations in the world's history have lived between the hot and moist tropical belt and the cold and sterile frigid regions of the Northern Hemisphere. Within this belt lies the United States, extending far enough south to be favored with semitropical products, yet stretching to the north sufficiently far to allow her sons to develop strength in the invigorating climate which makes them energetic men.

The following extracts from the introduction to a book on Weather Influences* may serve to present another viewpoint:

It would seem that in general authors attributed to the meteorological climate, properly so called, influences that are probably due to entirely different matters. For instance, the intelligence, industry, frugality, and humanity of the New England people, the enterprise of New York and Pennsylvania, the haughty bearing of the Southern people, are all of them characteristics that marked the ancestors of these same people when they were living under the same climate in their European homes three hundred years ago, and when they migrated from Asia thousands of years earlier still. It simply happened that political and social conditions in England and Holland led to the settlement of three different American colonies by three different classes of the emigrants, and we have no evidence whatever that the slight differences between the climates of Massachusetts, New York, Virginia, Pennsylvania, and Tennessee have had any appreciable influence in either forming or fixing these traits of character.⁴

The restless, ambitious men and women are in the minority even among enterprising nations. They are said to be especially numerous in the New England States, but this we think is principally a result of the fact that our ancestors were restless migrants, and is only partially the result of the severe climate of that region which killed off a large proportion of the early settlers and forces the remainder to live strenuous lives as the essential condition of existence. Agriculture is the principal labor of man, but where his labors are poorly rewarded he, and especially his children, inevitably seek for more favored regions. The mental and physical activities that are absolutely necessary in such climates as that of Great Britain, Canada, and the United States are not likely to develop a class of drones and are not consistent therewith.⁵

We have good foundation for the belief that a race may develop as well in one portion of the globe as in another so far as climate is concerned, after it has once become acclimated. The period over which our most accurate history and observation extends is too short to justify us in anything more than the recognition of the fact that at the present time dominant races are scattered around the North Temperate Zone, some of them in cold, dry, others in warm, moist climates, some in equable, and others in variable climates, and that they hold power over other tribes both in temperate and tropic zones by the power of their guns and powder rather than by any physical superiority; their intellectual development has been essentially the result of breeding and the building up of families by great attention to genealogies. Their

motto has been, "Blood will tell." We must not attribute to climate that which is more likely to be due to inheritance, but having allowed for the latter influence, we may then search among the outstanding discrepancies for that which is properly due to weather and climate.⁶

BIBLIOGRAPHY.

In the preparation of this paper most of the American histories in common use have been consulted, as well as other works along similar lines. Those which have been most helpful, and those to which special reference is made in the paper, are named below.

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DAMAGE BY FROST AT MIDDLEBRANCH, OHIO.

The following letters from the cooperative observer at New Berlin, Ohio, describe some peculiar features of the damage done by frost at Middlebranch, Ohio, on the night of June 15, 1908:

NEW BERLIN, OHIO, June 20, 1908.

MR. J. WARREN SMITH,
Local Office, Weather Bureau, Columbus, Ohio.

DEAR SIR: You are aware ere this that on the night of 15th instant, or last Tuesday morning, there was frost in Ohio in places. Seemingly in my immediate vicinity not very much damage resulted, except that wheat, if injured, will probably show up at threshing time. The mini-

* Weather Influences. E. G. Dexter, with an Introduction by Cleveland Abbe. New York, The Macmillan Co., 1904.

⁴ Ibid, p. xii-xiii.

⁵ Ibid, p. xv.

⁶ Ibid, p. xxx.

thermometer here was 36° and grass and plantain leaves were frosted stiff, also asparagus was hurt some; beans, muskmelon, cucumber, and other garden truck were not injured whatever. But 4 miles east of my place, on the farm of Ed. S. Correll just west of the village of Middle Branch, a strange phenomenon occurred.

In a field of corn, about 6 inches high, two rows of corn around the outside of the field were practically destroyed by the frost; rest of field not injured. There is an old worm rail fence on the east side of the field and near this frost was worst; there is no fence on one side adjoining the oats; on another side a picket fence; the other a wire fence. Besides, across the road from this, were sixteen rows of corn about 18 inches high. This was frozen so it has become bleached, and whether it will recover is hard to tell until later. On this farm the thermometer was also 36°, Mr. Correll informs me. This farm is not perhaps quite so high above sea level as my place, but this corn is not growing in any depression. The whole farm is about at the same level, and surrounding farms are mostly at the same level. There was some frost damage in low places in other parts of this township (Plain) which I can understand, and I know that there are frost lines on higher or lower ground or different elevations, but such as this occurring on the farm of Mr. Correll I have never heard of before. Some information regarding this phenomenon, if anything on record in the history of the Weather Bureau, would be much appreciated; and if nothing on record as cause, etc., I believe it would be advisable for you to see the place and investigate the matter for the benefit of the service. If the damage does not show up in our crops more than now visible it was the queerest frost ever experienced in this section.

Yours, respectfully,

CLAYTON HOLL.

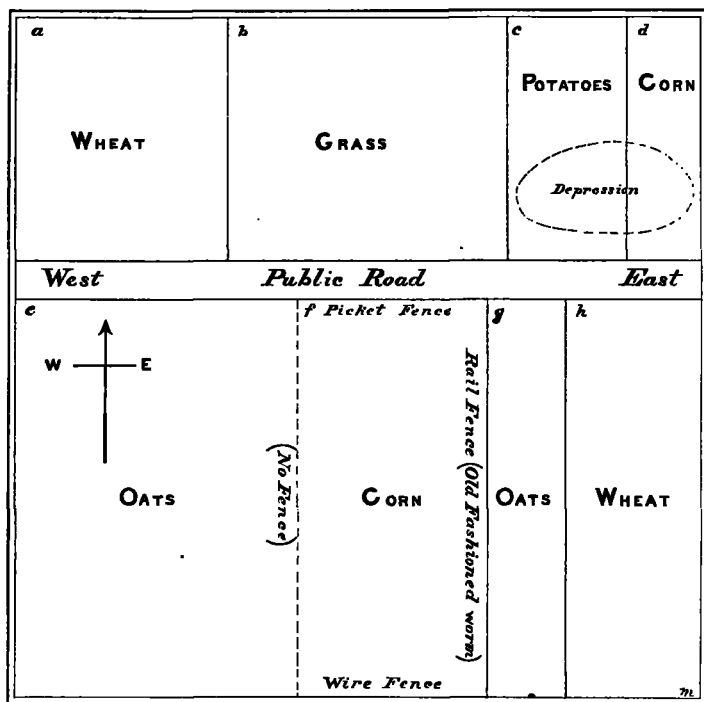


FIG. 1.—Diagram showing fields where peculiar frost damage occurred. a, 12 acres of wheat; b, 26 acres of grass; c, 35 rows (2½ acres) of potatoes; d, 16 rows of corn; in the depression indicated the corn and potatoes were badly damaged; e, 16 acres of oats, slightly higher than the corn when the frost occurred; f, 10 acres of corn; in this cornfield there was damage to about two rows around the outside, a little the worst along the rail fence on the east side; the corn was about 6 inches high when frosted; g, 4 acres of oats; h, 7 acres of wheat.

NEW BERLIN, OHIO, June 27, 1908.

Mr. J. WARREN SMITH,
Section Director, Columbus, Ohio.

DEAR SIR: I have to-day visited Mr. Correll's farm and have made a plat (fig. 1), rather roughly, but you will get some idea at least. This farm is mostly level and not particularly lower than surrounding farms. On the corn plot mostly damaged there is a slight hollow, possibly 8 or 10 feet lower in lowest place than other parts of corn plot, and there the corn will hardly recover to make a crop, while other parts will make possibly a full crop. There is also a farm nearly 1 mile south of Mr. Correll's place, where about 1½ acres of potatoes were nearly one foot high when frosted, and by appearance to-day will not make a crop; otherwise nothing seems to be damaged on this place. There were also in the village of Middle Branch, on several lots, a few sweet potato plants frozen, while those on adjoining lots were perhaps not touched. All this country surrounding is comparatively level and there is not much difference in the

soil. The 16 rows of corn [on Mr. Correll's place] grew very fast and therefore may have been more tender than smaller corn, being on rich ground and some fertilizer being used, and planted the second week of May.

I believe this answers your questions, and perhaps when you hear from Washington we may get further information. For as low as the thermometer registered, it was the queerest frost ever experienced in this section in my lifetime of 50 years.

Yours, respectfully,

CLAYTON HOLL.

Comment by J. Warren Smith, Section Director, dated Columbus, Ohio, July 18, 1908:

Mr. Holl says that the 16 rows of corn had grown very fast, being on rich soil and well fertilized, and therefore might have been more tender than smaller corn, but he cannot understand the reason for the injury to the two rows around the outside edge of the 10-acre lot.

An area of high barometric pressure lay over the northeast on the night of the 15th and there was a slight air movement across the State from the east or northeast. It is my opinion that the rail fence on the east and the picket fence on the north of this field served as sufficient wind-breaks to hold the air nearly still for a few feet close to the fences. This still air got colder than the surrounding moving air by the loss of its heat to the plants that were in turn cooled by radiation, thus the still air just past the freezing point and frost damage was caused. On the opposite side of the field the oats, being slightly higher than the corn, would also serve as a wind-break and hold a thin layer of air back for a few feet. The damage was not so great on this side as it was next to the rail fence.

In the other cases the damage was probably due to slight differences in elevation, color of the soil, character of the soil, or differences in the frost sustaining power of the plants.

EDITORIAL COMMENT.

The question is as to the injury done by the frost, whether it was due to (1) the tenderness of the plants or (2) the severity of the cold; and in the latter case whether it was due to (a) local cold air drainage or (b) more intense radiation. It is likely that each of these three causes was respectively responsible for the frost phenomenon in some particular part of the field.

As to the "two rows of corn around the outside edge of the 10-acre lot" nothing less than a careful personal study of this special field would possibly discover the true explanation. It is perfectly possible that on one side cold air drainage from the field to windward; on another side, rich, moist soil and plant tenderness; on the third side, excess of radiation unbalanced by reflection from the fence; on a fourth side, the local drainage of cold air from the field itself down to the "hollow" represented by Mr. Holl in his letter of June 27, 1908, resulted in damage by frost.—C. A.

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. FITZHUGH TALMAN, Librarian.

UPPER AIR OBSERVATIONS IN EGYPT.

At a meeting of the Royal Meteorological Society, London, May 20, 1908, Mr. B. F. E. Keeling, director of the Helwan Observatory (near Cairo) described the upper air observations that are being carried on in Egypt. The Nile flood, upon which the prosperity of all Egypt depends, is controlled by the rainfall of Abyssinia. As but few rainfall reports are obtainable from Abyssinia, where no meteorological service yet exists, it is hoped to make up for this lack of information by observing the upper air over Egypt by means of pilot balloons and kites. One interesting result already attained is the observation of the return trade wind, confirming the observations of Rotch and Teisserenc de Bort over the Atlantic Ocean. At Helwan the return trade is encountered at an altitude of about 6,500 feet. One balloon ascent, of 54,000 feet, appears to have past entirely thru the southwest return trade and to have encountered a northwest current above it.